

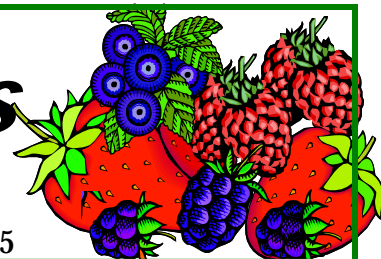


New York Berry News

CORNELL UNIVERSITY

Volume 04, Number 7

July 15, 2005



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Hampshire College, Amherst, Mass. (978) 355-2853, nofa@nofamass.org, www.nofamass.org.

August 17-19, 2005. *NASGA's 8th Annual Summer Tour, "Farming on the Urban Fringe"* in Fishkill, New York. See article below for more details.

October 14-15, 2005. *Passive Solar Greenhouse Workshop.* 1522 Lefever Lane, Spring Grove, Pennsylvania. **Contact:** Steve and Carol Moore (717) 225-2489.

October 14-15, 2005. *Highbush Blueberry Council (USHBC) Fall Meeting,* Amway Grand Plaza Hotel, 187 Monroe NW, Grand Rapids, Michigan. . **Contact:** 616-885-2000

December 6-8, 2005. *Great Lakes Fruit, Vegetable, and Farm Market EXPO.* DeVos Place Convention Center, Grand Rapids, Mich. www.glexpo.com.

December 1-7, 2005. *International Society for Horticultural Science 9th International Rubus and Ribes Symposium,* Pulcon, Chile. **For more information contact:** Pilar Banados, Facultad de Agronomia Ingenieria Forestal, Universidad Catolica de Chile, Casilla 306-22, Santiago, CHILE; fax: 56-2-55334130, E-mail: pbanados@puc.cl or online: <http://www.faif.puc.cl/rubus-ribeschile.html>

January 4-6, 2006. *North American Berry Conference;* Savannah International Trade and Convention Center, Savannah, GA. For more information contact Georgene Thompson, 717-243-1349 or georgenethompson@comcast.net or visit <http://www.nasga.org>.

February 1-3, 2006. *Mid-Atlantic Fruit and Vegetable Convention.* Hershey Lodge and Convention Center, Hershey, PA. For more information contact the Pennsylvania Vegetable Growers Association at pvga@pvga.org or visit <http://www.pvga.org/>.

BERRY IMPORTANT DATES!

Cathy Heidenreich, Department of Plant Pathology, Cornell University, NYSAES

Here is a checklist to help remind you of seasonal chores for the month of July. For more information on strawberry renovation, see news brief and article that follow. For more information on the other small fruit

This month's issue is jam-packed with the latest information on berry important topics, including post-harvest essentials, new berry research in progress, opportunities for continuing education, new websites and products, and more on marketing how-to's. Hope you find something useful to your operation on every page.

UPCOMING MEETINGS

August 11, 2005. *Tour of Small Fruits at Cornell Orchards.* Cornell Orchard Store, Route 366, Ithaca, NY. 6:00-8:00 pm. See news brief below for more information.

August 11-14, 2005. *Northeast Organic Farming Association 31st Annual Summer Conference.*

production topics on this month's checklist, see the [2005 Pest Management Guidelines for Small Fruit](#) and past issues of the NYBN.

Strawberries:

Renovation

Disease management-post renovation

Powdery mildew

Leaf blight, leaf spot, leaf scorch

Insect management

Tarnished Plant Bug

Potato Leaf Hopper

Strawberry Root Worm

Root Weevils

Brambles: Summer-bearing

Disease management

Powdery Mildew

Gray Mold

Insect management

Tarnished Plant Bug

Japanese Beetle

Sap Beetle

Potato Leaf Hopper

Brambles: Fall-bearing

Disease management

Raspberry Leaf Spot

Powdery Mildew

Gray Mold

Insect management

Japanese Beetle

Sap Beetle

Japanese Beetle

Potato Leaf Hopper

Two-Spotted Spider Mites

Raspberry Aphid

Blueberries

Disease management

Anthraxnose

Insect management

Leaf Rollers

Blueberry Maggot

Japanese beetles

Blueberry Stem Borer

Currants and gooseberries

Fertilizer

Application #3

Disease management

White Pine Blister Rust

Leaf spot/Anthraxnose

Powdery Mildew

Insect management

Currant Aphid

Imported Currant Worm

Currant Borer

Currant Stem-girdler

Gooseberry Fruitworm

Two-Spotted Spider Mite

FRUITFAX

Debbie Breth, Cornell Cooperative Extension, Lake Ontario Fruit Team

Fruit FAX-Horticultural and Pest Management Notes, is a weekly subscription service for growers. Recipients receive weekly faxes with current pest conditions and management recommendations. For more information or to subscribe to this service, please contact Debbie Breth at 585-747-6039

STRAWBERRIES: It's time for renovation to disrupt diseases and insects in the plantings and to catch up on weed control. Start with the application of 2,4-D amine for broadleaf weed control. Wait 5 days, then mow down to about an inch above the crowns. Stinger is also labeled for use after harvest before mowing or later in the season when Canada thistles start to re-grow. It is effective for specific weeds, not a broad-spectrum broadleaf weed control - see label for more information. Narrow up rows to 10-12 inches. And on varieties that are not sensitive to Sinbar, apply Sinbar before leaves start to grow again. The alternative herbicide is Dacthal. The sooner the plantings or individual varieties are renovated and overripe fruit destroyed, the better the sanitation for pests like sap beetles. Apply 70 lb. N per acre at renovation in the form of ammonium nitrate.

(Reprinted from: Fruit FAX-Horticultural and Pest Management Notes, July 13, 2005. For more information or to subscribe to this service, please contact Debbie Breth at 585-747-6039.)

RASPBERRIES: Raspberries are ripening. Botrytis sprays should have started at first bloom and again at full bloom, but the warm, humid weather is good for gray mold, so maintain fungicide protection during rainy weather through harvest using Elevate, Switch, or Rovral. Watch for tarnished plant bug, mites, and Japanese beetle. Sevin or carbaryl and malathion are labeled for control of TPB and Japanese beetle. Brigade, a pyrethroid is also registered for use on caneberrries for control of leafrollers, but will likely control these pests as well.

Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide.

(Reprinted from: Fruit FAX-Horticultural and Pest Management Notes, July 5, 2005. For more information or to subscribe to this service, please contact Debbie Breth at 585-747-6039.)

CORNELL SMALL FRUITS TOUR SCHEDULED

A Small Fruits Tour has been scheduled for August 16, 2005 at the Cornell Orchard, Route 366, Ithaca, NY. The twilight tour is scheduled from 6 PM to 8 PM. The program will include a show and tell of the Cornell Orchard small fruit plantings with Dr. Marvin Pritts, Professor of Horticulture, and berry specialist at Cornell.

Marvin will also discuss the production and marketing of some unusual small fruits, such as hardy kiwi berries, currants, gooseberries, and more. Current research going on at CU Orchards with strawberries, raspberries, and other small fruits will also be discussed.

MANY THANKS!

We wish to thank Lori Bushway for her many contributions to the New York Berry News during her tenure with Dr. Marvin Pritt's small fruit extension program. Lori, one of our most faithful authors and contributors, has accepted a position with the Community Horticulture Program in the Department of Horticulture. Her new duties will include coordination of adult-based programming, including Master Gardeners. We wish her all the best in her new position. Lori's contact information is as follows:

Lori Bushway, Senior Extension Associate
Community Horticulture Program
Department of Horticulture
167 Plant Sciences Bldg.
Cornell University, College of Agriculture and Life Sciences
Ithaca, NY 14853
Phone: 607-255-5918
E-mail: ljb7@cornell.edu

Cathy Heidenreich will succeed Lori in assisting Dr. Pritts with small fruit extension. She will be in Ithaca on Tuesdays in 110 Plant Science (607-255-2041) or she may be reached at The New York State Agricultural Experiment Station-Geneva other weekdays at 315-787-2433. Her e-mail will remain the same: mcm4@cornell.edu.

TracBerry® RECORD-KEEPING AND REPORTING SOFTWARE NOW AVAILABLE

What is Trac Software?

Trac is an easy-to-use software program for growers to record their yearly spray and fertilizer treatments. From the master spray data sheet, Trac automatically generates the processor report forms, Eurepgap forms, and EPA WPS Central Posting.

Four Trac Software CDs are available:

TracApple® – Apple and Pear

TracGrape® – Grape

TracBerry® – Strawberry, Blueberry, Raspberry & Blackberry, and Ribes

What hardware and software do I need?

Microsoft Excel
CD Rom Drive
Printer

Each CD has a comprehensive, 22-page, Trac Software Manual. Use copy and paste to move information from 2004 or 2003 into Trac 2005. As always -Trac 2005 has the latest pesticide information, based on the 2005 Cornell Guidelines.

How does Trac work?

Those familiar with working on a spreadsheet will find it easy to use Trac Software, since it is written in MS Excel, a popular spreadsheet program. Very simply, the user "fills in the blanks." There are data entry worksheets, much like



sheets of paper. One sheet asks for basic grower information, such as name and address. Another sheet allows the user to enter their spray information, such as the spray date and chemical used. From the data entry worksheets, the program automatically completes the processor spray report forms.

Are there other benefits to using Trac?

We think so! Trac has “drop down” lists for pesticides and pests that you can select from. This saves time and prevents typing errors. When you select a pesticide Trade Name from the drop down list the program automatically fills in the EPA registration number, REI, PHI and calculates the earliest harvest date. The software also generates drop-down lists specific to your farm operation. And it will automatically fill out an EPA WPS Central Posting form.

How often is Trac updated?

Trac software is updated on a yearly basis. This means you get the most up-to-date information on pest management materials. Trac software information is based on the Cornell Pest Management Guidelines that are updated yearly.

Trac Software was developed and written by Juliet Carroll, Fruit IPM Coordinator, and, Judy Nedrow, Trac Programmer. Carroll notes, “One of the major efforts Judy Nedrow and I worked on this past year was to develop TracBerry for strawberry, blueberry, raspberry & blackberry, and Ribes. Many thanks to those of you who helped in collating all of the pesticides for input into the software program.

I would like to highlight a new feature for 2005 in Trac Software that is particularly applicable to TracBerry. Judy and I created IPM Elements worksheets that will tally the percent of IPM Elements being practiced by the grower. These worksheets, for strawberry, raspberry, and blueberry, are included in the TracBerry software.”

Funding for Trac Software has been provided by: The New York State Department of Agriculture and Markets, The New York Wine and Grape Foundation, and the New York Agriculture Innovation Center

Orders may be sent to:

Michele Kaufman, 315 787 2419, mrk25@cornell.edu

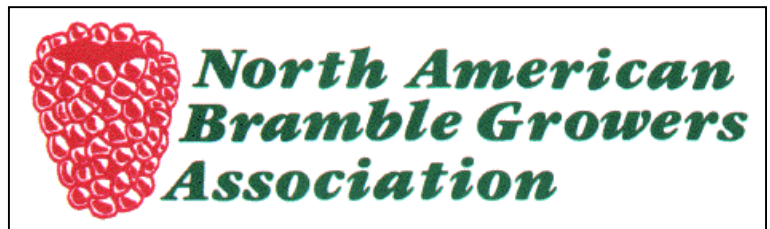
Trac Software, NYS IPM Program, 630 West North St., Geneva, NY 14456

Online information is available at <http://www.nysipm.cornell.edu/trac/index.html>

NABGA LAUNCHES IT'S NEW WEBSITE!

Debbie Wechsler, NABGA Executive Secretary

The North American Bramble Growers Association has launched a new website to promote raspberries and blackberries to consumers, provide information to growers and researchers, and encourage communication within the bramble industry. The web address is www.raspberrylblackberry.com.



“We wanted an address that consumers would understand and remember,” said Debby Wechsler, NABGA executive secretary, “and neither ‘nabga’ nor ‘bramble’ work—a lot of people outside agriculture don’t really know what the bramble fruit are. This website explains what the brambles are right on the home page. We’ve worked hard to make www.raspberrylblackberry.com a valuable resource for consumers and therefore a useful marketing tool for bramble growers.”

The main subsections of the website are About NABGA, Consumers, Events, Growers, Kids, Media, Members Only, Membership, and Recipes. The consumer section of the website includes information on nutrition and health benefits of raspberries and blackberries, basic botanical information, industry statistics, and home gardening resources. The Recipes section, which already has more than three-dozen recipes, will be an especially useful area for consumers and food media.

Information for growers includes a database of bramble experts, back issues of *The Bramble*, the association’s quarterly newsletter, and an extensive collection of links to on-line resources. A password-protected “Members Only” section includes an on-line membership directory, a member forum, recent issues of the newsletter, and a Marketplace through which members can offer supplies and equipment to buy or sell. An “Ask the Experts” service for members is also planned.

The website has been developed in partnership with the National Science Foundation Center for Integrated Pest Management, based at North Carolina State University and has been designed so that NABGA staff can easily update and manage it. CIPM has many years of technology experience and has developed websites for a number organizations and institutions. NABG appreciates the work and support of NSF-CIPM in this project, especially webmaster and designer Eva Zurek and CIPM Director Ron Stinner. For more information contact: Debby Wechsler, 919-542-3687.

NEW BRAMBLE DISEASE FOUND IN OREGON

Oregon Department of Agriculture News, May 31, 2005

P*hragmidium violaceum*, a rust species new to North America, has reportedly been found along the southern coast of Oregon impacting weedy Himalayan blackberry plants. This rust is used for biocontrol of invasive blackberry in Australia, New Zealand, and Chile, where research has shown it to have a very narrow host range of specific weedy blackberry species.



Research is underway to confirm that Oregon's commercially produced and native blackberry varieties are not susceptible. Fungicides are available if desirable blackberries varieties are found to be susceptible. Currently, the rust is limited to the southern coast of Oregon in Coos and Curry counties. Identification of this particular rust is difficult and it can easily be confused with other blackberry diseases.

Comments Dr. Bernadine C. Strik, Oregon State University: "I and others at OSU are working with the ODA to quickly test susceptibility of our true native blackberry *R. ursinus* and our commercial *Rubus* cultivars to this pest. Fortunately, in other blackberry production areas, particularly New Zealand, this pest has not been a problem for commercial blackberries and if present can be controlled using existing fungicides. Still the first step here must be to test this fungus on our important cultivars."

For more information, visit the Oregon Dept. of Ag. website: <http://www.oregon.gov/ODA/news/050525rust.shtml>.
(Reprinted with permission from *Bramble* Vol. 2,1 No.2, Summer 2005.)

FOLIAR LEAF ANALYSIS

Marvin Pritts, Department of Horticulture, Cornell University's College of Agriculture and Life Sciences, Ithaca, NY

Plant tissue analysis is used to measure directly the amount of nutrients in various plant parts, and for established perennial crops, is usually a better indicator of nutrient status than a soil test. Recommendations are based on the levels of 13 essential nutrients in your leaves at a specific time of the year (usually mid-summer). Unlike visual diagnoses, foliar nutrient analysis can alert the grower when nutrient levels are approaching deficiency so corrective action can be taken before problems occur. They also alert the grower if fertilizer is being over-applied. Unlike soil tests, foliar analysis provides accurate results for all essential mineral nutrients, not just for the 4 or 5 reported in soil tests.

For strawberries, recommendations are based on newly expanded leaves collected after renovation in late July or early August. Other sampling times or plant parts may prove to be more appropriate for certain nutrients, but until more detailed studies are done, foliar samples collected in mid-summer are the standard because nutrient levels fluctuate little then. For raspberries, select fully expanded primocane leaves in early August. For blueberries, select young leaves exposed to full sun in late July. Collect at least 50 leaves, remove their petioles, and wash them in distilled water. Dry them, place them in a paper bag, and send them to the laboratory for analysis. Samples should be representative of the entire field. If a

particular area of the field looks poor or has been fertilized differently from the rest, sample it separately. A leaf analysis, including nitrogen, costs \$28. Results should return from the lab within 2 - 3 weeks.

Many nutrients can be applied in fall, and the recommendations will provide details on when to apply particular nutrient fertilizers and in what quantities. The leaf analysis is accurate only if the soil pH is within an acceptable range (5.5 - 7.0 for raspberries and strawberries; 4.0 - 5.0 for blueberries). Conduct a foliar tissue analysis every other year. The soil pH should be monitored regularly, and a complete soil test performed every three years. Always be alert for any unusual appearance of leaves, and for unexplained reductions in growth or yield. Sampling kits for are available through Cornell Cooperative Extension educators or you may obtain sampling kits directly from the lab. [Cornell Nutrient and Analysis Laboratories](#), 804 Bradfield Hall Ithaca, NY 14853, **phone:** (607) 255-4540; **fax:** 607-255-7656 or: email: soiltest@cornell.edu.

DEVELOPING BLACK RASPBERRY FOR DIVERSIFIED AND SUSTAINABLE AGRICULTURE SYSTEMS IN THE NORTHEAST

Courtney Weber, Associate Professor, Department of Horticultural Sciences, and Cathy Heidenreich, Research Support Specialist, Department of Plant Pathology, Cornell University's New York State Agricultural Experiment Station at Geneva, NY



Black raspberries (*Rubus occidentalis*) have the potential to be a highly profitable crop for growers in the north central and northeastern states in a diversified production system. They are a high value crop with a gross revenue potential of \$12,000 per acre or more (retail) in peak production seasons. However, establishment costs are high and budget projections indicate the breakeven point to come in the second production season, some 26 months after planting. Unfortunately, productivity in currently available cultivars can begin to decline after two production seasons due to pest pressure. Typical yields in the region range from 1 to 3 tons per acre compared to 3 to 7 tons per acre for red raspberry, with fruit size generally less than 2.5 grams per berry. Thus, higher demand and prices and/or more productive, disease resistant cultivars are needed for the black raspberry to be a viable crop for most growers.

Black raspberries are recognized as an especially good source of phytochemicals and antioxidants, vitamins, minerals and fiber while being naturally low in calories, and fat free. Recent medical research has fueled renewed interest in the black raspberry for its potential health benefits, and the flavor of the berries maintains interest in consumers. Laboratory studies have shown black raspberries to have extremely high levels of antioxidants, especially anthocyanins and other flavonoids. Tests in rats have shown reductions in cancerous tumor formation and cholesterol levels as well as possible anti-aging properties possibly due to the tremendous antioxidant capacity of black raspberries.

Black raspberry production in the eastern U.S. had enjoyed a long history but has declined due to low yielding, disease susceptible cultivars. Production was centered in New York in the early 1920's, but market conditions, along with production problems have reduced the eastern industry to a few hundred acres across the region. The vast majority of production today is centered in Oregon and is based on one cultivar, 'Munger', which was introduced in 1897. However, black raspberry is an ideally suited crop for the northeast because it is the center of origin for the species, thus climatic conditions in the region are well suited for its production. Many cultivars that are currently available were developed in New York or are derived from germplasm from the region.

Two major diseases exacerbated the stagnation of black raspberry production in the northeastern U.S. in recent years, due in large part to low yields and short planting life spans (commonly referred to as "Raspberry run-out"). Wilt, caused by the fungus *Verticillium albo-atrum*, and Raspberry Mosaic Disease Complex, caused by Blackberry Necrosis, Rubus Yellow Net and/or Raspberry Leaf Spot-like viruses, are significant impediments to long term productivity of plantings.



Figure 1: Bluestem wilt of raspberry. Plugging of vessels by fungus causes wilt and characteristic blue discoloration of canes. (photo courtesy of APS Press)

Verticillium or bluestem wilt, cannot be controlled through chemical or cultural practices. Furthermore, once established, *Verticillium* has the ability to persist in soils for long periods. The best means for control is through genetic resistance, which is unfortunately lacking in most commercial cultivars. Bluestem wilt reduces yields by wilting, stunting, and eventually killing individual fruiting canes or entire plants. It is prevalent in poorly drained soils and is especially problematic following cool, wet springs that are common in the northeastern U.S. Although resistance in commercial cultivars is generally lacking, resistance may reside in related species, in a recessive state or in uncharacterized germplasm.



Figure 2: Initial symptoms of bluestem wilt on inoculated seedling.

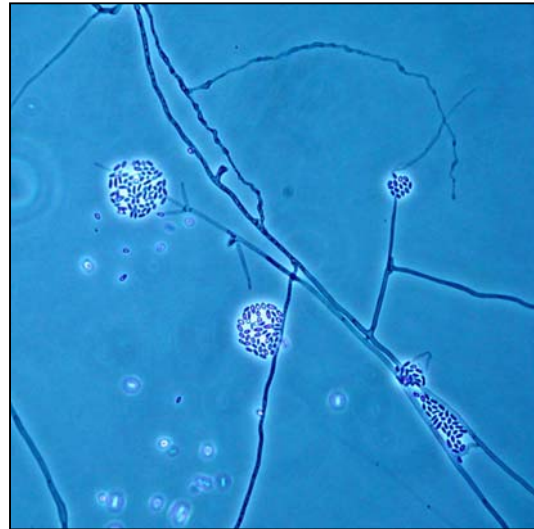


Figure 3: Spore producing structures (phialides) and spores (conidia) of *V. albo-atrum*

(Photos courtesy of C. Heidenreich)

Raspberry mosaic disease complex, associated with the 3 viruses mentioned above, causes great reduction in growth, vigor, and fruit yield through a progressive reduction of vigor over the life of the planting. This disease is spread by the larger currant aphid (*Amphorophora agathonica*) and possibly by the black raspberry aphid (*Amphorophora sensorata*). Avoidance of the mosaic disease complex is commonly achieved through resistance to the aphid vector and breeding for resistance to aphid colonization.



Figure 4: Aphid-borne mosaic complex virus. Mottling on 'Munger' black Raspberry.



Figure 5: Rubus Yellow Net Virus

(Photos courtesy of APS Press)



Figure 6: Large Raspberry Aphid (*Amphorophora agathonica*)

The rise of regional marketing programs has increased the demand for locally produced fruit to meet labeling requirements. Increased demand for locally grown fruit for fruit wine production and fresh consumption may raise local prices and increase the viability of black raspberry production. Growers in New York and the northeast can be reintroduced to this crop by showcasing commercially available cultivars in replicated trials. In addition, further work in breeding for increased yields and superior disease resistance will lead to new cultivars with improved market potential. Unfortunately, federal and state researchers have not been in a position to provide support to growers interested in black raspberry production. In the past 25 years, most publicly funded breeding programs for black raspberries were discontinued. Only three new cultivars were introduced during this 25 -year period, while in comparison, hundreds of red raspberry, strawberry, and blueberry cultivars were developed. Renewed efforts on this crop are critical to once again make black raspberry a viable option for growers in N.Y. and the northeastern U.S.

Recently, a research project was funded in support of this effort. The project, based at Cornell University's New York State Agricultural Experiment Station at Geneva, N.Y., brings together expertise in plant breeding, plant pathology, and entomology, to address current black raspberry production problems and develop long-term solutions to those problems. Collaborators on the project include Dr. Greg English-Loeb, small fruit entomologist, and Dr. Juliet Carroll, Fruit IPM Coordinator from Geneva, and Dr. Robert Martin, Research leader/plant pathologist, from USDA-ARS Horticultural Research Unit, Corvallis, Oregon. The Hatch Initiative Program using Federal Formula Funds for the Station is providing funding for the project.

A replicated trial of nine commercial black raspberry cultivars currently available for production in the U.S., along with two advanced selections (one black and one purple raspberry) from the Cornell breeding program, was established at Geneva this spring. Most of these cultivars are not familiar to N.Y. growers. These plantings will be used to demonstrate the potential and suitability of black raspberry production in N.Y., and to determine which existing cultivars are best suited for N.Y. production. Total yield, average fruit weight and marketable fruit will be assessed; marketable fruit will be classified as fresh market or processing.

Pest resistance will also be evaluated in multiple ways over the course of the 3-season project. Already, efforts are underway to identify and utilize a wide range of raspberry germplasm to: 1) increase resistance to major diseases, 2) increase fruit yields and quality and 3) identify sources of resistance to the 2 aphids that transmit mosaic virus complex. Some initial crosses have been made and progeny from these crosses are now in a screening program to identify genotypes resistant to *Verticillium*.

More information will be forthcoming as the project progresses. A Field day is planned when the plots are mature to allow growers to compare the different commercially available cultivars and evaluate advanced selections from the Cornell breeding program. These field days will allow side-by-side comparisons of fruit and plant characteristics.

COOPERATIVE RESEARCH ON STRAWBERRY POWDERY MILDEW TO BENEFIT AGRICULTURAL PRODUCERS FROM MANY NATIONS

Cathy Heidenreich, Research Support Specialist, Department of Plant Pathology, Cornell University, Geneva, NY*

**Based on the proposal "Improved management of strawberry powdery mildew through development and deployment of forecasting systems" prepared by Arne Stensvand, David M. Gadoury, and Robert C. Seem*

Research is often a cooperative effort involving scientists across disciplines and in some cases, across continents or oceans. Researchers and agricultural producers from all geographic locales involved benefit from these collaborative projects. Recently, one such effort was undertaken by scientists in Norway and here in the U.S. Scientists from both countries are working together to develop an improved management system for strawberry powdery mildew control. The project, spearheaded by Dr. Arne Stensvand, from the Department of Plant Pathology, Plant Protection Centre, Norwegian Crop Research Institute in Norway, is a joint effort with Dr. Robert Seem, Professor, and Dr. David Gadoury, Senior Research Associate, at the New York State Agricultural Experiment Station, Cornell University, Geneva, NY. Aspects of the project will be completed both in Norway and here in the U.S. Knowledge gained from efforts in both countries will be brought together in a comprehensive disease management system for strawberry powdery mildew that will be of use not only in the countries of the investigating scientists, but worldwide. The project is funded entirely by the Norwegian Research Council.

Strawberry culture in Norway

Norway is approximately 2.5 times the size of New York State, with an area of 125,050 square miles. Approximately 1,600 hectares (3,954 acres) were under strawberry production in Norway in 2000. About 80% of this production was for fresh market berries, with the remainder sold for processing. Production was dispersed among 1,300 growers, with an average yield of 5 tons/ha. The most common production system was the matted row, which distinguished Norway's strawberry production from the annual production systems of warmer regions of Europe and the U. S., and glasshouse production of cool climates. Less than 1% of Norway's production is under plastic tunnels or in glasshouses. The matted row system is one of the lower-yielding systems in use today, but has relatively low coats of establishment, requires no specialized equipment to establish or maintain, and is thus both attractive and profitable for production in Norway. The perennial nature of the planting, and the potential dense canopy development are both factors to consider in disease management programs, i.e. programs developed under other systems may not be readily transferable to perennial matted row systems.

Nearly half of Norway's area planted to strawberries is comprised of the cultivar 'Korona'. Other popular cultivars included Bounty, Polka, and Senga S, none of which are highly resistant to powdery mildew. Approximately 60% of the transplants used in Norway are grown on-farm. Remaining plants are obtained from a variety of commercial sources within Norway. Importation of plants from other countries is prohibited. On-farm production provides an inexpensive and ready source of plants for the establishment of plantings, but may contribute to build-up of certain pathogens, and should again be considered as a component of a disease management program.

There is considerable potential for increased strawberry production. Norway currently imports nearly 2000 tons of fresh strawberries during months when they could be locally produced in the field, and an additional 280 tons at times of the year that they could be produced in glasshouses, when retail prices are approximately 3 times higher. Powdery mildew may be particularly severe on plants grown in glasshouses and under tunnel production.

The Powdery Mildew Problem

Powdery Mildew, caused by the fungus *Sphaerotheca macularis*, is one of the most important diseases of strawberries in Norway. Historically, its importance has waxed and waned with the introduction of new fungicides, loss of fungicides to resistance, introduction of mildew resistant cultivars, and subsequent erosion of resistance, and variable weather which unexpectedly favored or limited the disease. Benomyl, originally one of the most effective fungicides ever discovered for powdery mildew, rapidly developed such widespread resistance worldwide that manufacture of the product was discontinued. Korona, the most widely planted strawberry in Norway, was introduced as a mildew resistant cultivar in 1983, but field resistance rapidly declined and is now a mildew-susceptible variety. Another chemistry, commonly called DMI fungicides, has recently declined in efficacy against many powdery mildews. Most recently, a new class of strobilurin fungicides has exhibited spectacular efficacy against a broad range of powdery mildews. Unfortunately, they have exhibited equally spectacular resistance problems after only 3 years of commercial use. Thus, Norway presently has few attractive options for management of powdery mildew.

Figure 1: Powdery mildew on leaf tips surface



Figure 2: conidia chains



Figure 3: cleistothecia on the lower leaf surface



(Photos by C. Heidenreich)

Varieties selected out of economic necessity for fruit quality, winter hardiness, and yield under Nordic conditions, may not exhibit resistance to powdery mildew. Growers may alternatively select a variety purported for resistance, but stability of this resistance cannot be guaranteed. While fungicide alone may initially provide control when deployed intensively, such deployment is counterproductive with respect to resistance development. Each successive discovery and marketing of new chemistry for powdery mildews over the last 25 years has been followed by development of resistance to the new chemical class.

In the U.S., strawberry powdery mildew has been a recurrent problem both in California and Florida. Changes in weather patterns have also given rise to an increase in strawberry powdery mildew occurrence in other areas of the country, such as New York State. Mildew incidence in N.Y. has been on the rise for the past several years.

Where Do We Go From Here?

Strawberry growers are at a disadvantage in developing a comprehensive disease management program due to a general lack of information on the biology of the pathogen, *S. macularis*. In comparison, extensive work has been done here in the U.S. and abroad by the Stensvand program, the Seem program, and others to document the many aspects of pathogen biology required to develop a comprehensive grapevine powdery mildew management system. This management system is now in use worldwide. Powdery mildew expertise gained by this group of scientists through the course of their grape investigations will now be focused on carrying out the comprehensive investigation of the epidemiology of *S. macularis* required to generate biological data upon which any forecasting system could be based, regardless of local. How will they know when they have succeeded? The final goal of this four-year project is to develop and deploy a simple host development and weather driven model to assist growers worldwide in the management of strawberry powdery mildew.

STRAWBERRY RENOVATION

Sonia Schloemann and A. Richard Bonanno, UMass Extension

Matted row strawberry plantings benefit from a process called 'renovation' after harvest to stimulate new growth to support next year's crop and to interrupt the build-up of certain pests and diseases mid-way through the growing season. For best results, renovation should be started immediately after the harvest is completed to knock down two-spotted mites, sap beetles, and/or root weevils and to promote early runner formation. Early runner-set translates to higher yield potential the following year. Build-up of leaf spots and other foliar pathogens can be cleaned up with this process, too. Renovation should be completed by late-July in normal years. The following steps describe renovation of commercial strawberry fields. Specific rates and timing of applications can be found in the



1. Begin weed control. Annual broadleaf weeds can be controlled with the 2,4-D amine formulation (Amine® 4 or Formula 40) applied immediately after final harvest. Be extremely careful to avoid drift when applying 2,4-D. Some strawberry damage is also possible if misapplied. Read and understand the label completely. If grasses are a problem, sethoxydim (Poast) will control annual and some perennial grasses. However, do not tank mix Poast and 2,4-D.

2. Mow the old leaves off. Mow just above the crowns **3-5 days after herbicide application**. Be careful not to damage crown by mowing too low.

3. Fertilize the planting. The main goal is to deliver nitrogen at this time to help re-grow the canopy. Nitrogen should be applied at 25-60 lbs/acre, depending on vigor and basic soil fertility. Split applications (one now and the rest in 4-6 weeks) are better than a single fertilizer application. This gives plants more time to take up the nutrients in the fertilizer. A leaf tissue analysis (recommended once the canopy has regrown) is the best way to fine-tune your fertilizer program. This will tell you what the plants are actually able to take out of the soil and what nutrients are in sufficient supply or not. See [Leaf Tissue Test Sampling Instructions](#) for more on this.

4. Subsoil. Where tractor and picker traffic has been heavy on wet soils, compaction may be severe. Subsoiling between rows will help break up compacted layers and provide better infiltration of water. Subsoiling may be done later in the sequence if necessary.

5. **Narrow rows and cultivate between rows.** Reduce the width of rows to 12-18 inches at the base. More berries are produced along row edges than in row middles. Wider rows lead to lower fruit production (yield and quality) and increased disease pressure. Narrow rows also give better sunlight penetration, air circulation, spray coverage, and over-all fruit quality. Use a roto-tiller, multivator, or cultivator to achieve the row narrowing. Work in the straw between the rows at this time, too. If possible, try to throw 1-inch of soil on top of the rows at this time to stimulate new root formation on established crowns and new runners.

7. **Post-renovation weed control.** Preemergence weed control should begin immediately after the plants are mowed and the soil is tilled to narrow the crop row. The most common practice at this time is to apply half the annual rate of terbacil (Sinbar at 4 oz/acre). It is essential that the strawberry plants be mowed, even if 2,4-D was not applied, to avoid injury from Sinbar. If regrowth of the strawberry plants has started, significant damage may result. Some varieties are more sensitive to 3 Sinbar than others. If unsure, make a test application to a small area before treating the entire planting. Sinbar should not be used on soils with less than 0.5% organic matter or on reportedly sensitive varieties such as Guardian, Darrow, Tribute, Tristar, and possibly Honeoye. Injury is usually the result of too high a rate or overlapping of the spray pattern. If Sinbar is not used, napropamide (Devrinol at 4 lb/acre) or DCPA (Dacthal at 8- 12 lb/acre) should be applied at this time. Dacthal is preferred over Devrinol if the planting is weak. If Sinbar is used, napropamide (Devrinol at 4 lb/acre) should be applied 4 to 6 weeks later. This later application of Devrinol will control most winter annual weeds that begin to germinate in late August or early September. Devrinol should be applied prior to rainfall or it must be irrigated into the soil. During the summer, Poast can be used to control emerged grasses.

Cultivation is also common during the summer months. Cultivations should be shallow and timely (weeds should be small) to avoid root damage to the strawberry planting. The growth of strawberry daughter plants will also limit the amount of cultivation possible especially near the crop row.

8. **Irrigate.** Water is needed for both activation of herbicides and for plant growth. Don't let the plants go into stress. The planting should receive 1 to 1-1/2 inches of water per week from either rain or irrigation.

9. **Cultivate to sweep runners into the row** until plant stand is sufficient. Thereafter, or in any case after September, any runner plant not yet rooted is not likely to produce fruit next year, is essentially a weed, and should be removed. Coulter wheels and/or cultivators will help remove these excess plants in the aisles.

10. **Adequate moisture and fertility** during August and September will increase fruit bud formation and improve fruit yield for the coming year. Continue irrigation through this period and fertilize if necessary. An additional 20- 30 pounds of N per acre is suggested, depending on the vigor.

(Reprinted from UMASS Berry Notes, Vol. 17, No.9, July 8, 2005)

PREVENTION OF PRE- AND POST-HARVEST FRUIT ROTS IN BLUEBERRIES

Annemiek Schilder, Plant Pathology

As harvest is upon us, take note of the pre-harvest interval (PHI) for the various fungicides. Most fungicides that you would use at this time of the year have a 0-day PHI, but Topsin M has a 7-day PHI. Blueberries may benefit from applications of fungicides for fruit rot control close to the first harvest and even between harvests, since anthracnose rot incidence can increase greatly at the later harvests.

The main diseases of concern at this time of the year are fruit rots, such as anthracnose (orange wet spore blobs) and Alternaria fruit rot (green velvety layer of spores). Botrytis fruit rot (gray mold) is usually not a problem in Michigan, but can occur, especially in wet years. Anthracnose is often a problem in cultivars such as Bluecrop, Jersey, and Rubel, while Alternaria fruit rot is more common in Bluecrop. Elliott is moderately resistant to anthracnose. While fruit rot is usually not visible until the berries ripen, it is prudent to assume you will have a fruit rot problem if you had problems last year. If the first blueberries are starting to show rot, fungicide sprays can limit new infections of neighboring healthy berries. Often, these berries look healthy at harvest, but start to rot soon after in the lugs while awaiting processing. Rot may be slowed down by refrigerated storage, but will resume on the supermarket shelves, lowering fruit quality. Applications close to the first harvest or between harvests can still be beneficial in preventing these late infections. In fact, an application between the first and second harvest may be recommended as well under high disease pressure.

The strobilurins (Abound, Cabrio, Pristine) are all highly effective against anthracnose, with Pristine having the most broad-spectrum activity since it contains two different active ingredients. However, it probably is also the most expensive

of the three. Pristine will also have excellent activity against Phomopsis, while Cabrio has good and Abound fair activity against this disease. All have moderate to good activity against Alternaria fruit rot and become quickly rainfast since they are locally systemic. Switch (cyprodinil and fludioxonil) also has some systemic properties and provides simultaneous control of anthracnose, Alternaria, and Botrytis fruit rots. Thus, it may be a good choice if several fruit rots are a concern, e.g., in 'Bluecrop.' Aliette (fosetyl-Al) is a highly systemic fungicide that provides good control of anthracnose, Alternaria fruit rot and Phomopsis. Of course, Topsin plus Captan can still be used, provided the 7-day PHI of Topsin is taken into consideration. While Topsin is very active against Phomopsis, Captan will do most of the work against anthracnose. Therefore, if anthracnose is the disease you wish to control, a Captan or Captec spray alone may suffice. Just remember that Captan is a protectant that can be washed off in heavy rain. As such, it also does not provide any post-infection activity.

(Reprinted from: MCAT Vol. 20, No. 13, July 2005)

EMAIL MARKETING ON OUR FARM

Dan Copeland of Sweet Berry Farm in Marble Falls, Texas. Dan gave a talk on this at the North American Berry Conference in February, 2005.

Do you have an existing internet/email account? For the purpose of this talk, we are going to assume everyone has an account and knows how to use email. If you do not, chances are that any teenager in your family will be happy to explain how to get your own account and how to use email as soon as possible.

How do we use email to market the farm?

We normally open the season softly; in other words, production is still on the upward side of the curve. We do not like to advertise much the first few weeks because we are afraid of getting more customers than we have fruit (something we have vowed not to let happen). We can attempt to regulate our initial customer flow by trickling out Season Opening email notifications. As production increases, so does the number of notifications being sent. Once the entire email list has been sent, we will begin additional advertising. • We notify customers when a new crop is being harvested. Most of our customers seem to need to be reminded when the next crop is ripe. • Invariably, there will be times in the production cycle of our crops when supply is overshadowing demand. It is important to state that we *never* deviate from the base price of our fruit. Once you have destroyed that base price, customers will always want the reduced rate, even in subsequent years. Instead, if we feel that we *must* give some sort of discount to encourage sales, we will do it using coupons or quantity discounts. With the email list, we will notify our customers that NOW appears to be a great time to harvest. We also like to include a coupon – simply a portion of the email that the customer can print out and bring in. The quantity or dollar amount of the coupon varies with the amount of fruit that needs to be harvested. It is important to point out that the coupon always has a “valid” time period (normally just a week to encourage immediate response) and the note “one per customer.” We also encourage recipients to forward the email/coupon to all their friends – that is what we want: more pickers! Customers love to send their friends the coupons and by doing so, they are hopefully increasing our customer base. Where this normally bites us in the rear is when a customer prints out a bunch of coupons and hands one to everyone else in the checkout line. We do not harvest fruit for wholesale, even in times of glut. Instead of spending money on pickers and then trying to find an instant market, we take that money and advertise more. Hopefully this will get more customers out in the time of need and help us in the long run by increasing our customer base. • We like to let our customers know of important upcoming dates or special events such as when we are set to close and reopen again or remind them of the upcoming disk dog tournament. • Sweet Berry Farm is closed to the public roughly five months out of the year. While trying not to be a nuisance, we like to send our customers one notice in the off-season just to keep us fresh in their minds. • Email is good for press releases – you can send out press releases to different forms of media in just a little bit of time. The problem with this use is that the media normally receives tons of email and chances are they might skip over yours or delete it as “Junk Mail.”

So, what is the big deal about email marketing?

The most important thing to recognize in the use of email is that each letter you send out to your customers is basically free. It takes very little time to send them out and the recipient receives that letter instantly. The Sweet Berry Farm email list has a little over 2400 names on it (I realize this is small). If at 8:00 am Monday morning I decide that a notice needs to go out because the previous weekend was rained out and I have fruit that needs harvesting, I can have 2400+ letters delivered into the hands of my customers by 10:00 am that same day. Granted, not all the letters will be read that day, not a lot of customers are going to drop what they are doing and head to the farm instantly (a few will, though) and some of the letters will be deleted as “Junk Mail.” But I normally expect to see a response by the end of the week and for sure by the coming weekend.

What is the cost?

The cost of this “direct email” depends on if you slate the \$14.95 (or thereabout) monthly Internet expense to your business or personal account. Let’s say that you call it a business expense. I pay roughly \$120 per year for Internet access. If I send out six email notices per year at 2,000 per = 12,000 notices. At \$120 per year, my cost is now one penny per notice. Now, think what that will be when I double or triple the size of my email list. Not to mention that my kids now get to use the Internet for free.

Developing a list

An email list is no different from any other mailing list. The effectiveness of your email marketing will be determined by the quality of your list. So, how do you get the addresses for your list? *Voluntarily!* I believe you should only put folks on your list that WANT to be there. At Sweet Berry Farm, we collect addresses several ways. Normally it is just a simple pad of paper that a customer writes their address on. This pad is located at each of the checkout registers, in the Store area and at any booths we may have in various market shows. Sweet Berry Farm also has a website through which folks can join the list. A website is very useful to us but don’t sweat it if you don’t already have one. (In fact, I would argue a website’s usefulness if you can’t develop and maintain it yourself.) As mentioned before, we encourage customers to spread the news about the email list in hopes that their friends will want to get onboard.

The ‘Down Side’

You probably will not be able to develop a list instantly. Therefore, it is going to take a year or two to really begin to utilize email in your marketing plan. The majority of your list will be customers that have already attended your farm. Because of this, your customer base will not vastly increase due to email marketing. You do have to spend a little time typing the names into your address book. And, invariably, you won’t be able to read someone’s handwriting. I often try to encourage folks to send me an email, then all you have to do is right click on the email and choose ‘add sender to address list’ (if you use Outlook Express). This year I am going to try to set up an old computer in the store for people to type in the address themselves.

Suggestions when sending email

My wife says that I need to make the email notices more fancy; I like to keep them plain and simple. Most people are in a hurry and don’t want to spend a lot of time on your email. If it is plain and simple, it will also download a lot quicker into the customers’ inbox, very important to a lot of folks. This is a matter of personal preference. If at this point you do not know how to send an email – ask that teenager to help you and give them the following suggestions. • I like to send no more than a hundred at a time, it makes everything go faster. Send the original email to yourself, then be sure to put your customers addresses in the “**bcc**” field. This means that customers will not be able to see all the other addresses you sent to. • Compose your email, highlight the body, hit ctrl c to copy it, address it and send it out to some of your list, and then open a new email, hit ctrl v to paste the old email into the new one. Now you don’t have to retype the entire email. Use a local Internet service provider. Some of the online accounts will not let you send more than a hundred or so emails at a time (they think you are a spammer). Even your virus software will become suspicious if you send a bunch at a time. • I suggest putting your point in the subject line, for example, “The Strawberries are ready!” Some of your customers might delete the email before ever reading it if the subject line is blank. This is especially important if sending Press Releases to the media. An email plan is only one tool in your marketing handbag. The email program is very useful to us at Sweet Berry Farm, and we think we will be able to cut our marketing costs in half in the coming years through its use.

❖ Visit the Copelands’ website at <http://www.sweetberryfarm.com/>. This article is reprinted with permission from the conference Proceedings of the North American Bramble Growers

Check out the NYSAES Tree Fruit and Berry Pathology web site at:

www.nysaes.cornell.edu/pp/extension/tfabp

Questions or Comments about the New York Berry News?

Send inquiries to:

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Editor's Note: We are happy to have you reprint from the NYBN. Please cite the source when reprinting. In addition, we request you send a courtesy [e-mail](#) indicating NYBN volume, issue, and title, and reference citation for the reprint. Thank you.

WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 19th, 2005

| Temperature | Growina Dearee | Precipitation (inches) |
|-------------|----------------|------------------------|
|-------------|----------------|------------------------|

| | Days (Base 50) | | | | | | | | | | |
|----------------------------|----------------|-----|-----|------------------|------|------------------|-----|------|-------|-------|-------|
| | High | Low | Avg | DFN ¹ | Week | YTD ² | DFN | Week | DFN | YTD | DFN |
| Hudson Valley | | | | | | | | | | | |
| Albany | 90 | 57 | 71 | 5 | 151 | 725 | 150 | 1.24 | 0.39 | 5.72 | -3.00 |
| Glens Falls | 88 | 55 | 69 | 5 | 134 | 549 | 73 | 3.92 | 3.17 | 10.53 | 1.87 |
| Poughkeepsie | 90 | 53 | 71 | 5 | 149 | 704 | 79 | 2.66 | 1.78 | 10.42 | 0.15 |
| Mohawk Valley | | | | | | | | | | | |
| Utica | 89 | 54 | 69 | 4 | 132 | 611 | 104 | 2.55 | 1.57 | 9.82 | 0.00 |
| Champlain Valley | | | | | | | | | | | |
| Plattsburgh | 90 | 48 | 67 | 2 | 120 | 493 | 6 | 4.72 | 3.96 | 12.15 | 4.50 |
| St. Lawrence Valley | | | | | | | | | | | |
| Canton | 87 | 50 | 67 | 4 | 120 | 505 | 88 | 1.57 | 0.80 | 5.50 | -2.40 |
| Massena | 89 | 52 | 68 | 5 | 127 | 516 | 63 | 2.56 | 1.79 | 8.25 | 1.12 |
| Great Lakes | | | | | | | | | | | |
| Buffalo | 85 | 54 | 68 | 3 | 128 | 631 | 94 | 0.92 | 0.08 | 8.24 | -0.05 |
| Colden | 86 | 52 | 67 | 5 | 120 | 511 | 98 | 1.83 | 0.85 | 9.29 | -0.72 |
| Niagara Falls | 89 | 57 | 71 | 6 | 148 | 668 | 113 | 1.70 | 0.86 | 7.02 | -1.29 |
| Rochester | 87 | 55 | 68 | 4 | 128 | 581 | 37 | 1.50 | 0.80 | 7.82 | 0.59 |
| Watertown | 88 | 53 | 68 | 6 | 126 | 513 | 100 | 1.50 | 0.87 | 7.82 | 0.82 |
| Central Lakes | | | | | | | | | | | |
| Dansville | 90 | 48 | 68 | 2 | 125 | 569 | 36 | 2.03 | 1.12 | 7.51 | -0.63 |
| Geneva | 89 | 54 | 68 | 3 | 127 | 601 | 88 | 2.10 | 1.19 | 9.81 | 1.54 |
| Honeoye | 88 | 52 | 67 | 2 | 124 | 556 | 25 | 2.96 | 2.05 | 10.25 | 2.08 |
| Ithaca | 90 | 49 | 68 | 4 | 126 | 537 | 78 | 2.75 | 1.84 | 9.68 | 1.07 |
| Penn Yan | 90 | 53 | 69 | 4 | 134 | 633 | 120 | 2.49 | 1.58 | 8.86 | 0.59 |
| Syracuse | 90 | 54 | 70 | 5 | 141 | 703 | 152 | 1.26 | 0.35 | 8.06 | -0.91 |
| Warsaw | 84 | 48 | 64 | 2 | 99 | 464 | 87 | 4.08 | 3.04 | 11.00 | 1.38 |
| Western Plateau | | | | | | | | | | | |
| Alfred | 87 | 50 | 67 | 5 | 120 | 500 | 79 | 1.65 | 0.56 | 8.93 | -0.41 |
| Elmira | 89 | 46 | 68 | 4 | 131 | 557 | 65 | 0.99 | 0.08 | 8.75 | 0.48 |
| Franklinville | 85 | 50 | 66 | 6 | 113 | 417 | 95 | 1.16 | 0.11 | 8.79 | -0.75 |
| Sinclairville | 86 | 51 | 67 | 5 | 118 | 509 | 127 | 1.61 | 0.49 | 8.97 | -1.70 |
| Eastern Plateau | | | | | | | | | | | |
| Binghamton | 86 | 48 | 67 | 3 | 120 | 571 | 97 | 0.69 | -0.15 | 7.35 | -1.42 |
| Cobleskill | 89 | 54 | 69 | 6 | 134 | 526 | 93 | 1.10 | 0.12 | 7.45 | -2.15 |
| Morrisville | 89 | 50 | 67 | 5 | 120 | 497 | 92 | 2.54 | 1.56 | 9.34 | -0.07 |
| Norwich | 89 | 52 | 69 | 6 | 130 | 530 | 96 | 5.00 | 4.02 | 10.87 | 1.13 |
| Oneonta | 92 | 53 | 71 | 9 | 146 | 582 | 189 | 3.32 | 2.34 | 10.57 | 0.12 |
| Coastal | | | | | | | | | | | |
| Bridgehampton | 90 | 53 | 68 | 3 | 129 | 515 | 21 | 0.23 | -0.61 | 8.48 | -1.64 |
| New York | 91 | 61 | 75 | 4 | 176 | 897 | 70 | 0.19 | -0.65 | 6.74 | -3.12 |

1. Departure From Normal

2. Year To Date: Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (<http://www.nass.usda.gov/ny/>), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture.

**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 26th, 2005**

| | Temperature | | | | Growing Degree Days (Base 50) | | | Precipitation (inches) | | | |
|----------------------------|----------------------|-----|-----|------------------|-------------------------------|------------------|-----|------------------------|-------|-------|-------|
| | High | Low | Avg | DFN ¹ | Week | YTD ² | DFN | Week | DFN | YTD | DFN |
| | Hudson Valley | | | | | | | | | | |
| Albany | 92 | 47 | 70 | 2 | 142 | 867 | 161 | 0.20 | -0.64 | 5.92 | -3.64 |
| Glens Falls | 92 | 42 | 67 | 0 | 119 | 668 | 76 | 0.04 | -0.66 | 10.57 | 1.21 |
| Poughkeepsie | 91 | 50 | 69 | 0 | 131 | 835 | 77 | 0.34 | -0.50 | 10.76 | -0.35 |
| Mohawk Valley | | | | | | | | | | | |
| Utica | 92 | 45 | 68 | 2 | 129 | 740 | 117 | 0.06 | -0.92 | 9.88 | -0.92 |
| Champlain Valley | | | | | | | | | | | |
| Plattsburgh | 95 | 47 | 69 | 3 | 135 | 628 | 20 | 0.12 | -0.58 | 12.27 | 3.92 |
| St. Lawrence Valley | | | | | | | | | | | |
| Canton | 89 | 41 | 67 | 3 | 123 | 628 | 106 | 0.29 | -0.48 | 5.79 | -2.88 |
| Massena | 91 | 44 | 67 | 2 | 123 | 639 | 76 | 0.30 | -0.47 | 8.55 | 0.65 |
| Great Lakes | | | | | | | | | | | |
| Buffalo | 87 | 50 | 69 | 2 | 136 | 767 | 105 | 0.00 | -0.83 | 8.24 | -0.88 |
| Colden | 90 | 45 | 66 | 2 | 110 | 621 | 106 | 0.00 | -0.98 | 9.29 | -1.70 |
| Niagara Falls | 92 | 50 | 71 | 3 | 146 | 814 | 136 | 0.20 | -0.57 | 7.22 | -1.86 |
| Rochester | 92 | 48 | 68 | 1 | 125 | 706 | 45 | 0.00 | -0.70 | 7.82 | -0.11 |
| Watertown | 88 | 40 | 66 | 2 | 112 | 625 | 110 | 0.08 | -0.51 | 7.90 | 0.31 |
| Central Lakes | | | | | | | | | | | |
| Dansville | 92 | 44 | 66 | -3 | 113 | 682 | 27 | 0.04 | -0.87 | 7.55 | -1.50 |
| Geneva | 93 | 48 | 68 | 2 | 127 | 728 | 95 | 0.03 | -0.82 | 9.84 | 0.72 |
| Honeoye | 92 | 44 | 67 | -1 | 122 | 678 | 22 | 0.01 | -0.85 | 10.26 | 1.23 |
| Ithaca | 91 | 42 | 66 | 0 | 111 | 648 | 80 | 0.05 | -0.85 | 9.73 | 0.22 |
| Penn Yan | 93 | 49 | 69 | 3 | 137 | 770 | 137 | 0.01 | -0.84 | 8.87 | -0.25 |
| Syracuse | 95 | 49 | 70 | 4 | 140 | 843 | 173 | 0.05 | -0.86 | 8.11 | -1.77 |
| Warsaw | 87 | 46 | 65 | 2 | 106 | 570 | 98 | 0.05 | -0.93 | 11.05 | 0.45 |
| Western Plateau | | | | | | | | | | | |
| Alfred | 90 | 43 | 65 | 1 | 108 | 608 | 86 | 0.04 | -1.01 | 8.97 | 1.42 |
| Elmira | 91 | 39 | 65 | -2 | 108 | 665 | 58 | 0.10 | -0.80 | 8.85 | 0.32 |
| Franklinville | 89 | 40 | 63 | 0 | 92 | 509 | 100 | 0.03 | -0.95 | 8.82 | 1.70 |
| Sinclairville | 89 | 45 | 65 | 2 | 109 | 618 | 140 | 0.00 | -1.05 | 8.97 | 2.75 |
| Eastern Plateau | | | | | | | | | | | |
| Binghamton | 89 | 46 | 68 | 2 | 125 | 696 | 110 | 0.00 | -0.84 | 7.35 | 2.26 |
| Cobleskill | 91 | 43 | 67 | 3 | 120 | 646 | 108 | 0.03 | -0.95 | 7.48 | 3.10 |
| Morrisville | 87 | 43 | 64 | 1 | 102 | 599 | 95 | 0.11 | -0.83 | 9.45 | 0.90 |
| Norwich | 90 | 43 | 64 | -1 | 103 | 633 | 96 | 0.14 | -0.79 | 11.01 | 0.34 |
| Oneonta | 91 | 46 | 68 | 4 | 123 | 705 | 216 | 0.05 | -0.93 | 10.62 | 0.81 |
| Coastal | | | | | | | | | | | |
| Bridgehampton | 82 | 46 | 66 | -3 | 112 | 627 | 10 | 0.02 | -0.80 | 8.50 | -2.44 |
| New York | 93 | 60 | 74 | 1 | 167 | 1064 | 75 | 0.12 | -0.72 | 6.86 | -3.84 |

1. Departure From Normal

2. Year To Date: Season accumulations are for April 1st to date.

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, July 3rd, 2005**

| | Temperature | | | | Growing Degree Days (Base 50) | | | Precipitation (inches) | | | |
|----------------------------|-------------|-----|-----|------------------|-------------------------------|------------------|-----|------------------------|-------|-------|-------|
| | High | Low | Avg | DFN ¹ | Week | YTD ² | DFN | Week | DFN | YTD | DFN |
| Hudson Valley | | | | | | | | | | | |
| Albany | 94 | 54 | 77 | 7 | 187 | 1054 | 205 | 3.41 | 2.62 | 9.33 | -1.02 |
| Glens Falls | 91 | 49 | 73 | 6 | 165 | 833 | 114 | 0.78 | 0.09 | 11.35 | 1.30 |
| Poughkeepsie | 93 | 54 | 76 | 6 | 183 | 1018 | 117 | 1.69 | 0.79 | 12.45 | 0.44 |
| Mohawk Valley | | | | | | | | | | | |
| Utica | 92 | 49 | 75 | 7 | 174 | 914 | 163 | 0.00 | -0.92 | 9.88 | -1.84 |
| Champlain Valley | | | | | | | | | | | |
| Plattsburgh | 91 | 51 | 74 | 6 | 167 | 795 | 57 | 0.31 | -0.39 | 12.58 | 3.53 |
| St. Lawrence Valley | | | | | | | | | | | |
| Canton | 93 | 51 | 74 | 9 | 171 | 799 | 162 | 0.00 | -0.77 | 5.79 | -3.65 |
| Massena | 91 | 50 | 74 | 7 | 168 | 807 | 123 | 0.01 | -0.72 | 8.56 | -0.07 |
| Great Lakes | | | | | | | | | | | |
| Buffalo | 95 | 55 | 77 | 9 | 192 | 959 | 161 | 0.06 | -0.69 | 8.30 | -1.57 |
| Colden | 90 | 49 | 73 | 8 | 164 | 785 | 160 | 0.89 | -0.02 | 10.18 | -1.72 |
| Niagara Falls | 95 | 51 | 77 | 9 | 193 | 1007 | 194 | 0.08 | -0.63 | 7.30 | -2.49 |
| Rochester | 91 | 50 | 74 | 7 | 172 | 878 | 88 | 0.00 | -0.67 | 7.82 | -0.78 |
| Watertown | 92 | 48 | 73 | 7 | 162 | 787 | 157 | 0.29 | -0.22 | 8.19 | 0.09 |
| Central Lakes | | | | | | | | | | | |
| Dansville | 94 | 47 | 74 | 6 | 168 | 850 | 65 | 2.02 | 1.20 | 9.57 | -0.30 |
| Geneva | 92 | 51 | 74 | 6 | 167 | 895 | 132 | 1.58 | 0.79 | 11.42 | 1.51 |
| Honeoye | 92 | 44 | 74 | 5 | 168 | 846 | 55 | 0.58 | -0.19 | 10.84 | 1.04 |
| Ithaca | 90 | 47 | 73 | 7 | 166 | 814 | 128 | 1.81 | 0.97 | 11.54 | 1.19 |
| Penn Yan | 92 | 52 | 75 | 7 | 177 | 947 | 184 | 0.46 | -0.33 | 9.33 | -0.58 |
| Syracuse | 94 | 51 | 76 | 8 | 183 | 1026 | 227 | 0.25 | -0.66 | 8.36 | -2.43 |
| Warsaw | 87 | 48 | 71 | 7 | 147 | 717 | 141 | 0.06 | -0.85 | 11.11 | -0.40 |
| Western Plateau | | | | | | | | | | | |
| Alfred | 90 | 46 | 73 | 8 | 159 | 767 | 136 | 1.18 | 0.17 | 10.15 | -1.25 |
| Elmira | 92 | 42 | 72 | 5 | 159 | 824 | 91 | 1.06 | 0.22 | 9.91 | -0.10 |
| Franklinville | 90 | 40 | 70 | 7 | 144 | 653 | 148 | 1.08 | 0.15 | 9.90 | -1.55 |
| Sinclairville | 90 | 50 | 73 | 8 | 161 | 779 | 195 | 0.88 | -0.13 | 9.85 | -2.88 |
| Eastern Plateau | | | | | | | | | | | |
| Binghamton | 90 | 50 | 73 | 6 | 163 | 859 | 151 | 1.07 | 0.23 | 8.42 | -2.03 |
| Cobleskill | 92 | 47 | 73 | 8 | 164 | 810 | 157 | 1.19 | 0.27 | 8.67 | -2.83 |
| Morrisville | 89 | 50 | 72 | 8 | 159 | 758 | 145 | 0.97 | 0.07 | 10.42 | -0.83 |
| Norwich | 93 | 49 | 74 | 8 | 167 | 800 | 149 | 1.39 | 0.50 | 12.40 | 0.84 |
| Oneonta | 94 | 56 | 76 | 12 | 185 | 890 | 294 | 2.42 | 1.47 | 13.04 | 0.66 |
| Coastal | | | | | | | | | | | |
| Bridgehampton | 85 | 59 | 72 | 4 | 159 | 786 | 33 | 0.97 | 0.22 | 9.47 | -2.22 |
| New York | 92 | 66 | 77 | 4 | 193 | 1257 | 96 | 1.16 | 0.29 | 8.02 | -3.55 |

1. Departure From Normal

2. Year To Date: Season accumulations are for April 1st to date.

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, July 10th, 2005**

| | Temperature | | | | Growing Degree Days (Base 50) | | | Precipitation (inches) | | | |
|----------------------------|-------------|-----|-----|------------------|-------------------------------|------------------|-----|------------------------|-------|-------|-------|
| | High | Low | Avg | DFN ¹ | Week | YTD ² | DFN | Week | DFN | YTD | DFN |
| Hudson Valley | | | | | | | | | | | |
| Albany | 83 | 59 | 70 | -2 | 143 | 1197 | 198 | 3.28 | 2.55 | 12.61 | 1.53 |
| Glens Falls | 82 | 56 | 68 | -2 | 129 | 962 | 107 | 1.84 | 1.21 | 13.19 | 2.51 |
| Poughkeepsie | 83 | 56 | 70 | -3 | 141 | 1159 | 108 | 1.75 | 0.84 | 14.20 | 1.28 |
| Mohawk Valley | | | | | | | | | | | |
| Utica | 87 | 61 | 72 | 3 | 153 | 1067 | 180 | 1.31 | 0.40 | 11.19 | -1.44 |
| Champlain Valley | | | | | | | | | | | |
| Plattsburgh | 86 | 53 | 68 | -2 | 127 | 922 | 46 | 1.80 | 1.17 | 14.38 | 4.70 |
| St. Lawrence Valley | | | | | | | | | | | |
| Canton | 88 | 54 | 71 | 4 | 148 | 947 | 187 | 3.51 | 2.79 | 9.30 | -0.86 |
| Massena | 88 | 54 | 70 | 2 | 144 | 951 | 137 | 0.77 | 0.07 | 9.33 | 0.00 |
| Great Lakes | | | | | | | | | | | |
| Buffalo | 89 | 61 | 74 | 5 | 172 | 1131 | 189 | 0.42 | -0.27 | 8.72 | -1.84 |
| Colden | 86 | 55 | 69 | 3 | 137 | 922 | 178 | 1.52 | 0.68 | 11.70 | -1.04 |
| Niagara Falls | 92 | 59 | 75 | 6 | 179 | 1186 | 230 | 0.04 | -0.59 | 7.34 | -3.08 |
| Rochester | 88 | 59 | 72 | 3 | 153 | 1031 | 104 | 0.35 | -0.27 | 8.17 | -1.05 |
| Watertown | 89 | 57 | 72 | 5 | 154 | 941 | 186 | 1.60 | 1.18 | 9.79 | 1.27 |
| Central Lakes | | | | | | | | | | | |
| Dansville | 88 | 53 | 70 | 0 | 138 | 988 | 65 | 1.91 | 1.17 | 11.48 | 0.87 |
| Geneva | 87 | 60 | 71 | 2 | 148 | 1043 | 142 | 0.78 | 0.07 | 12.20 | 1.58 |
| Honeoye | 89 | 53 | 70 | -1 | 142 | 988 | 53 | 1.44 | 0.77 | 12.28 | 1.81 |
| Ithaca | 85 | 56 | 70 | 2 | 141 | 955 | 143 | 0.91 | 0.12 | 12.45 | 1.31 |
| Penn Yan | 86 | 59 | 71 | 2 | 149 | 1096 | 195 | 1.46 | 0.75 | 10.79 | 0.17 |
| Syracuse | 91 | 63 | 75 | 6 | 173 | 1199 | 262 | 0.53 | -0.38 | 8.89 | -2.81 |
| Warsaw | 84 | 55 | 68 | 3 | 128 | 845 | 157 | 0.75 | -0.06 | 11.86 | -0.46 |
| Western Plateau | | | | | | | | | | | |
| Alfred | 86 | 52 | 69 | 3 | 132 | 899 | 151 | 1.78 | 0.85 | 11.93 | -0.40 |
| Elmira | 86 | 56 | 70 | 2 | 141 | 965 | 99 | 1.56 | 0.75 | 11.47 | 0.65 |
| Franklinville | 84 | 48 | 67 | 3 | 120 | 773 | 165 | 1.35 | 0.49 | 11.25 | -1.06 |
| Sinclairville | 86 | 55 | 69 | 3 | 135 | 914 | 218 | 1.35 | 0.42 | 11.20 | -2.46 |
| Eastern Plateau | | | | | | | | | | | |
| Binghamton | 83 | 59 | 69 | 0 | 134 | 993 | 155 | 0.92 | 0.09 | 9.34 | -1.94 |
| Cobleskill | 82 | 56 | 68 | 1 | 126 | 936 | 161 | 1.93 | 1.09 | 0.60 | -1.74 |
| Morrisville | 83 | 54 | 68 | 2 | 126 | 884 | 155 | 1.17 | 0.33 | 11.59 | -0.50 |
| Norwich | 84 | 49 | 69 | 2 | 136 | 936 | 163 | 2.08 | 1.25 | 14.48 | 2.09 |
| Oneonta | 86 | 59 | 71 | 6 | 147 | 1037 | 326 | 2.09 | 1.18 | 15.13 | 1.84 |
| Coastal | | | | | | | | | | | |
| Bridgehampton | 80 | 57 | 68 | -3 | 130 | 916 | 19 | 1.02 | 0.32 | 10.49 | -1.90 |
| New York | 83 | 62 | 73 | -4 | 159 | 1416 | 75 | 1.89 | 0.98 | 9.91 | -2.57 |

1. Departure From Normal

2. Year To Date: Season accumulations are for April 1st to date.

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 13th, 2005**

| | Temperature | | | | Growing Degree Days (Base 50) | | | Precipitation (inches) | | | |
|----------------------------|----------------------|-----|-----|------------------|-------------------------------|------------------|-----|------------------------|-------|------|-------|
| | High | Low | Avg | DFN ¹ | Week | YTD ² | DFN | Week | DFN | YTD | DFN |
| | Hudson Valley | | | | | | | | | | |
| Albany | 91 | 59 | 78 | 13 | 199 | 574 | 119 | 0.61 | -0.26 | 4.48 | -3.39 |
| Glens Falls | 89 | 50 | 74 | 11 | 168 | 415 | 43 | 0.41 | -0.36 | 6.61 | -1.30 |
| Poughkeepsie | 93 | 60 | 78 | 13 | 198 | 555 | 52 | 1.24 | 0.33 | 7.76 | -1.63 |
| Mohawk Valley | | | | | | | | | | | |
| Utica | 92 | 57 | 76 | 13 | 185 | 479 | 78 | 0.97 | 0.01 | 7.27 | -1.57 |
| Champlain Valley | | | | | | | | | | | |
| Plattsburgh | 88 | 51 | 71 | 8 | 151 | 373 | -5 | 0.23 | -0.49 | 7.43 | 0.54 |
| St. Lawrence Valley | | | | | | | | | | | |
| Canton | 90 | 54 | 74 | 13 | 168 | 385 | 62 | 0.02 | -0.75 | 3.93 | -3.20 |
| Massena | 90 | 53 | 73 | 12 | 165 | 389 | 35 | 0.23 | -0.47 | 5.69 | -0.67 |
| Great Lakes | | | | | | | | | | | |
| Buffalo | 90 | 62 | 77 | 13 | 188 | 503 | 79 | 2.28 | 1.44 | 7.32 | -0.13 |
| Colden | 88 | 60 | 75 | 14 | 173 | 391 | 69 | 1.64 | 0.66 | 7.46 | -1.57 |
| Niagara Falls | 91 | 63 | 78 | 15 | 199 | 520 | 78 | 0.41 | -0.40 | 5.32 | -2.15 |
| Rochester | 91 | 61 | 77 | 14 | 189 | 453 | 16 | 0.90 | 0.20 | 6.32 | -0.21 |
| Watertown | 90 | 52 | 74 | 13 | 169 | 387 | 64 | 0.20 | -0.50 | 6.32 | -0.05 |
| Central Lakes | | | | | | | | | | | |
| Dansville | 93 | 60 | 76 | 13 | 186 | 445 | 22 | 1.03 | 0.12 | 5.48 | -1.75 |
| Geneva | 96 | 60 | 78 | 15 | 194 | 474 | 69 | 1.11 | 0.24 | 7.71 | 0.35 |
| Honeoye | 92 | 54 | 75 | 12 | 179 | 432 | 14 | 1.49 | 0.62 | 7.29 | 0.03 |
| Ithaca | 91 | 57 | 76 | 14 | 182 | 411 | 51 | 0.86 | -0.02 | 6.93 | -0.77 |
| Penn Yan | 93 | 61 | 77 | 14 | 192 | 499 | 94 | 0.82 | -0.05 | 6.37 | -0.99 |
| Syracuse | 94 | 60 | 79 | 16 | 204 | 562 | 119 | 0.44 | -0.42 | 6.80 | -1.26 |
| Warsaw | 86 | 64 | 75 | 15 | 174 | 365 | 73 | 0.53 | -0.47 | 6.92 | -1.66 |
| Western Plateau | | | | | | | | | | | |
| Alfred | 89 | 58 | 74 | 13 | 171 | 380 | 51 | 1.52 | 0.47 | 7.28 | -0.97 |
| Elmira | 90 | 53 | 74 | 12 | 169 | 426 | 38 | 2.64 | 1.77 | 7.76 | 0.40 |
| Franklinville | 89 | 53 | 73 | 14 | 159 | 304 | 59 | 2.01 | 1.02 | 7.63 | -0.86 |
| Sinclairville | 87 | 60 | 74 | 14 | 172 | 391 | 96 | 1.46 | 0.40 | 7.36 | -2.19 |
| Eastern Plateau | | | | | | | | | | | |
| Binghamton | 89 | 61 | 75 | 13 | 176 | 451 | 78 | 1.38 | 0.54 | 6.66 | -1.27 |
| Cobleskill | 90 | 56 | 75 | 14 | 174 | 392 | 53 | 0.15 | -0.83 | 6.35 | -2.27 |
| Morrisville | 87 | 56 | 73 | 13 | 164 | 377 | 60 | 0.58 | -0.40 | 6.80 | -1.63 |
| Norwich | 92 | 55 | 74 | 13 | 171 | 400 | 59 | 0.55 | -0.43 | 5.87 | -2.89 |
| Oneonta | 92 | 60 | 76 | 16 | 179 | 436 | 130 | 0.60 | -0.38 | 7.25 | -2.22 |
| Coastal | | | | | | | | | | | |
| Bridgehampton | 90 | 58 | 71 | 8 | 146 | 386 | 2 | 0.00 | -0.87 | 8.25 | -1.03 |
| New York | 92 | 66 | 79 | 10 | 204 | 721 | 44 | 0.70 | -0.11 | 6.55 | -2.47 |

1. Departure From Normal

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